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Congenital Heart Disease

PREDICTING OUTCOME FOLLOWING INFANT CARDIAC SURGERY

Poster Contributions
Hall C
Sunday, March 30, 2014, 3:45 p.m.-4:30 p.m.

Session Title: Advances in Congenital Heart Surgery
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Background: Many patient and procedural characteristics have been investigated for their impact on outcomes after infant heart surgery, but risk-stratification models incorporating early post-operative biophysical markers are lacking. This study aimed to identify independent risk factors for poor outcome and to build a risk stratification model.

Methods: This prospective, observational study in a pediatric cardiac ICU analyzed pre- and post-operative data in infants (< 12 months) undergoing cardiac surgery to determine which factors were associated with a composite "poor" outcome of death, emergent need for extracorporeal life support, and dialysis. Independent risk factors were used to build a simple risk score based on adjusted odds ratio (AOR).

Results: In 283 infants enrolled, factors significantly associated with poor outcome in univariate analyses were as follows: gender, age, size, STS-EACTS category, single ventricle, heart rate, arterial pressure, central venous pressure, vasoactive inotrope score, serum lactate, and arterial blood gas values including pH, bicarbonate and base excess. Multivariable logistic regression identified the following independent risk factors for poor outcome and points were assigned: male gender (AOR 4.4; 95% confidence interval (CI) 1.1, 17.4; 1 point), minimum pH ≤ 7.19 (AOR 6.7; CI 1.6, 27.4; 1 point), base excess ≤ -5.1 (AOR 9.9; CI 2.1, 47.7; 2 points) and lactate ≥ 5.6 (AOR 23.8; CI 2.8, 201; 3 points). The model had near perfect discrimination (C-statistic = .97) between high and low risk patients and was well calibrated (goodness of fit $\chi^2 = 2.72$, $p = .44$). Using the scoring system, the incidence of poor outcome increased linearly from 0% in patients with a risk score of 0 points (70.6% of the cohort) to 16.7% in patients with a risk score of 4-5 points (11.2% of the cohort) to 45.8% in patients with a risk score of 7 points (4.5% of the cohort).

Conclusions: Independent risk factors for poor outcome after infant heart surgery were identified and used to construct a simple risk score that accurately identified high and low risk patients based on early post-operative clinical variables. Once externally validated, this risk score may be helpful to guide therapy.